Operational Carlotta: Analyzing Joint Courses of Action

A Monograph
by
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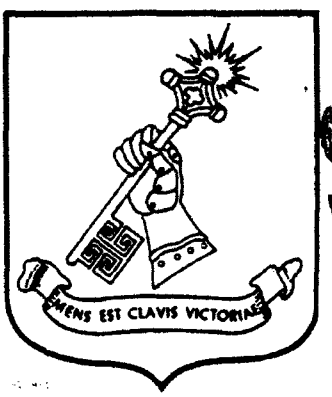
Infantry



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ABSTRACT

OPERATIONAL CARLOTTA: ANALYZING JOINT COURSE OF ACTION by MAJ Todd J. Ebel, USA, 65 pages.

Course of action analysis is a critical step in the traditional military decision making process. During this step, planners determine the suitability, feasibility, and acceptability of a possible solution. Common staff procedures for analyzing courses of action save time and enhance awareness of the entire operation.

The Joint Operations Planning and Execution System (JOPES) embraces the traditional military decision making process at the operational level. However, JOPES does not describe how to analyze a joint course of action. Consequently, many joint planners rely on their service's unique tactical decision making methods to help evaluate joint operational level solutions. Are these methods adequate for joint operations?

This study examines the adequacy of each service's course of action analysis method for use at the joint operational level. A methodology is suitable if it: 1) addresses key operational concepts, 2) facilitates interservice coordination, and 3) is adaptable to a wide variety of situations. The study determines that without some adjustments, each service's analytical method is inadequate to cover the breadth and scope of joint operations. Nevertheless, individual service planning doctrines provide a good starting point to develop a common method to analyze a joint operational level course of action.

Finally, the study recommends that joint planning doctrine, when rewritten, include a common method and criteria for analyzing joint courses of action.

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I. Introduction

Joint warfare is essential to victory.[2]

"Nobody conducts joint warfare better than the United States (US) military."[3] However, the range of scenarios requiring joint operations is expanding, and the nature of joint warfare is changing. For example, the US recently conducted joint operations other than war in Somalia. Today, we continue to support joint counter-narcotic operations along the southwest US border using improved Army and Air Force systems to alert local government officials. Additionally, recent improvements in weapons technology, such as the Army Tactical Missile System (ATACMS), is changing how services approach joint targeting.[4] Concurrently, force level reductions necessitate that services operate jointly in both peace and war. Prudence dictates that we must continue to examine our joint doctrine and recommend improvements to it.

This study aims to do just that. It argues that contemporary joint planning doctrine does not facilitate the optimal employment of joint forces. Specifically, operational level planning doctrine does not discuss how to analyze a joint course of action.

Course of action analysis is a critical step in the military decision making process.[5] During this step, planners weigh military options against three

criteria: suitability, feasibility, and acceptability and then recommend the best solution for the commander's decision. For this reason, how a course of action is analyzed is important. A poor analytical methodology, or several diverse analytical models -- each separate and unknown to the other services, can skew the conclusions derived. This point is especially significant today since

> the increasingly complex demands made by modern forces and by modern warfare [has] led to an explosion in the amount of data processed by any given command system to carry out the mission. As the quantity for data [rises], the difficulty of interpreting it in preparation for decision-making [is growing].[6]

On the other hand, a cooperative analytical approach that involves each service can contribute to a more well thought out and synchronized plan. Yet no current joint doctrinal manual describes techniques for conducting course of action analysis at the operational level.[7] Why not?

The purpose of this monograph is to recommend a standard methodology for analyzing joint courses of action. A common approach for analyzing courses of action has several advantages. First, a standard procedure saves time. Since the pace of combat operations is now greater than ever before, the time used for every thought, action, decision and reaction of each unit is vital. Any time saved provides an edge

to the modern commander.

Second, a standard method of analysis can improve each service's awareness of the entire joint operation. A common picture of the plan allows for maximum unity of effort.[8] Without a focus of effort, planners may waste forces or improperly position them so they do not favorably influence the operation. Enhanced awareness of the operation can also reduce the chance of fratricide and can improve battlefield targeting.

At the same time, a common approach to analyzing joint courses of action must not minimize the inherent strengths of each individual service. Each military arm is structured and equipped to operate in a distinct environment; they have unique capabilities and they approach problems differently. Compared to the Army, the Air Force and Navy share a more mechanistic and technical view of warfare. For example, the Air Force focuses on conducting a scientific analysis to devise a targeting scheme to shred an enemy's military or economic fabric.[9] Even the nature of objectives varies between the services. "On land, objectives are oriented to possession of terrain; at sea [or in the air], the objective is to ensure freedom or denial of use for a finite time."[10] Thus, any joint course of action analysis methodology must ensure the integration of each service's capabilities without a degradation of its strengths.

Methodology

In order to determine an optimal method for analyzing joint courses of action, this monograph first examines the nature of contemporary and future joint operations. Emphasis is on the need for improved synchronization between services. Second, this study surveys both joint and individual service decision making processes and reviews the distinct ways in which three services analyze courses of action. Th se are: 1) the Army's "Wargaming" method, 2) the Navy's Analysis Procedures, and 3) the Air Force's Air Campaign Concept Development Process.[11]

After each review, the study evaluates each service's procedure against three criteria. Does the method: 1) address key operational concepts and planning considerations, 2) encourage staff and service component interaction, and 3) facilitate adaptation to a wide variety of military situations. Conclusions derived from this evaluation should support the recommendations for a common course of action analysis methodology in joint planning doctrine.[12]

II. Joint Warfare Trends

> **The fact remains that the services are not alike, that no one can make them alike...on the question of fundamental loyalty, the officer who loves every other service just as much as his own will have just as much actual virtue as the man who loves other women as much as his own wife.**
>
> ***The Armed Forces Officer*** [13]

The need for harmony among the different fighting disciplines has been understood -- if not always practiced. In the past, the sum of each service's contributions was often only equal to the whole of the operation. "Jointness" did not guarantee a synergistic effect. For example, in 1983, joint forces of the United States military executed Operation Urgent Fury in response to an internal crisis on the island of Grenada. Units from the Army, Navy, and Air Force siezed key airfields, secured American students, and defeated the Grenadan Revolutionary Army in just six days. Ostensibly, the joint service mission was a success. However, a closer examination of events revealed that poor intelligence, interservice rivalry and a lack of interservice coordination nearly created a fiasco -- "a polite way of saying nobody had the faintest idea [what was going on]."[14]

During the course of planning for Operation Urgent Fury, no service wanted to be left out. To eliminate this interservice competition, the simple JCS solution was to split the island in half, one side to the Army, the other to the Marines -- "cut it up like a pie."[15] While the operation was joint, is was neither harmonious or synergistic.

The military made several changes in their *modus operandi* based on findings from an intensive critique of the Urgent Fury debacle. First, the 1986 Goldwaters-Nichols Defense Reorganization Act mandated improved "jointness" by structural reforms. Second, the military published new doctrinal manuals to encourage a more common understanding of joint operations. Third, tactical combat training centers, such as the Joint Readiness Training Center at Fort Polk, Louisiana, were activated to teach tactical units how to more effectively coordinate on the battlefield.

In 1989 and 1991, Operations Just Cause and Desert Storm illustrated the benefits of better coordinated joint operations. In Just Cause, overwhelming combat power, generated from the aggressive and simultaneous application of unique and complementary service capabilities, resulted in the neutralization of Pananamian Defense Forces in one day.[16] Similarly, Operation Desert Storm demonstrated that the synchronized actions of all US and coalition

services could swiftly and decisively punish the world's fourth largest military machine.

In the future, it is difficult to envision any military operation being other than joint, and as shown, a pie shape paradigm is dangerous. Therefore, the goal of joint doctrine must be to increase the overall effectiveness of the force -- to create synergy by efficiently synchronizing the actions of air, land, sea space, and special operations forces to achieve joint operational and strategic objectives. Equal involvement of forces is not necessary if all services understand their role in accomplishing the mission efficiently.[17]

The technological revolution is quickly shaping the US military's view of joint warfare. Simultaneity, or "parallel warfare," is the trend. Improved technologies enable the military to strike multiple objectives at once. With a lean and highly technical force structure, the US aims at the synchronous paralysis of key enemy strategic, operational and tactical targets in order to force quick and decisive victories. As in Operation Just Cause, the goal is to crush the enemy in one blow. Serial warfare is on its way out.[18]

Consequently, the service branches are increasingly interdependent. "No single weapon *or force* reaches its full potential unless employed with

complementary capabilities [emphasis added]."[19] All forces can directly impact across the depth, breadth and height of the battlefield. The military uses weapons designed for strategic and operational level targets for tactical purposes and vice versa. For example, the Air Force's B-52 bomber can provide close air support to ground forces. Likewise, the Army's ATACMS can engage enemy air defense systems at operational depths to protect air interdiction missions. This range of interservice capabilities provides joint force commanders with many options to synchronize quick, decisive actions.

The increasing range of service capabilities forces modern commanders to change their traditional warfighting perspective. Normally,

> [w]here the sailor or airman thinks in terms of the entire world, the soldier thinks in terms of theaters, in terms of campaigns or in terms of battles ...Where the sailor and the airman are almost forced, by the nature of the sea and the air, to think in terms of a total world or, at the least, to look outside the physical limits of their immediate concerns, the soldier is almost literally hemmed in by his terrain.[20]

Under these conditions which exist today, distinct boundary lines on a map delineate maritime from air and land areas of operations to facilitate operational control of forces. In the future, limited quantities of sophisticated weapon systems suggest that areas of

operation need not be contiguous --"cross boundary" actions will be common. Accordingly, the services require better methods of coordination and control based on a more universal perspective of war.

This brief survey on future joint warfare highlights key points. The US military prefers to quickly generate decisive combat power to defeat the enemy. Improvements in target acquisition and weapon systems technology support this desire. However, by itself, technological superiority may not necessarily guarantee military victory. These technological systems must be synchronized. This becomes difficult because the services do not necessarily share an identical view of how to prosecute the war with the systems they have in hand. Therefore, to be more effective, services must improve their ability to synchronize their actions to achieve the desired military end state. The military must develop training, tactics, and doctrine that facilitates interservice cooperation and coordination.

III. Doctrinal Decision Making Processes

Decision making is an inherent responsibility of any leader. However in the military, decision making is unique if only because of the nature of warfare. Warfare is dangerous and uncertain and no decision can guarantee complete success. People die! Therefore, commanders "must decide upon the one plan of action they *think* promises the *best* opportunity of enabling them to accomplish their true mission."[21] Their knowledge of the situation, history, and personal experience guide them in their decision making process.

How a commander arrives at a decision is certainly a matter of personal determination. For some commanders, the process is intuitive; they believe they possess *coup d'oeil*. Unfortunately, this process is not easily modeled; hence, it is difficult to adopt as a doctrinal decision making methodology.[22] Consequently, the military embraces a more comprehensible and rational decision making model. Theoretically, this process helps commanders to derive an optimal solution by following a six step systematic and unemotional analysis of facts and assumptions: 1) recognize and define the problem, 2) gather facts and make assumptions to determine the scope of the problem, 3) develop possible solutions, 4) analyze each solution, 5) compare the outcome of each solution, and

6) select the best solution available.[23]

This section illustrates the decision making processes each military service employs and it outlines the doctrinal joint decision making procedures. While each process is similar, there are differences. All reflect the criticality of analyzing courses of action.

Army Decision Making

The Army's decision making process consists of a series of sequential and parallel steps. At the "heart of Army decision making" is the Estimate of the Situation (Appendix A).[24] During this continuous process, the commander and staff analyze newly assigned missions and consider the factors having significant impact on the mission. Next, they develop, evaluate, and compare alternative solutions until one is adopted for development into a plan. Once a plan is finalized, the commander, staff and subordinates execute the plan.

Today, decision making is even more arduous because of the increasing complexity of the battlefield. Commanders "must now cope with three times the complexity that confronted Clausewitz who described the simplest action in war, as he knew it, as difficult."[25] Modern warfare is fast paced, dynamic, and lethal. Commanders routinely "must operate under conditions of stress and uncertainty [in which] the amount of available information varies greatly and is

usually time sensitive...."[26] They must quickly make decisions where conflicting and ambiguous information predominates.

Army doctrine recognizes that short decision cycles characterize contemporary combat operations. The final draft version of *FM 101-5, Command and Control for Commanders and Staff*, the manual that governs planning procedures, describes conditions in which different methods of decision making are appropriate. Commanders and staffs use the *deliberate* decision making process before actual hostilities begin. During this formal, structured, and time consuming process, staff officers conduct their own estimate of the situation. They use this estimate to provide information and to develop and analyze solutions. During the analysis phase, the commander and staff "wargame" proposed courses of action.[27] Based on this wargame, the staff makes recommendations to enable the commander to make more informed and sound decisions.

Commanders use *combat* and *quick* decision making methods when no staff is available or when time is critical.[28] In these situations, commanders normally abbreviate the deliberate process and formulate a solution based on personal experience and recognition of a situation as familiar. This "personal experience" gives commanders a sense of what alternatives are

feasible and acceptable.

Navy Decision Making

NWP 11, Naval Operational Planning, is the Navy's doctrinal manual that governs decision making. It divides the planning process into four phases and a series of subsequent steps for each phase. The four phases are: 1) Commander's Estimate of the Situation, 2) Commander's Plan, 3) Commander's Directive and 4) Supervision of the Planned Action. The first phase is relevant to this study.

During the estimate of the situation phase, "the commander analyzes courses of action for accomplishing the mission, and on the basis of that analysis, selects one."[29] The Navy's seven steps are similar to the other services' processes. First, the commander conducts a mission analysis. Second, he identifies factors that might affect possible courses of action. These include hydrography, oceanography, weather, relative combat power, strengths and weaknesses, and time and space factors. Third, he considers the enemy's capabilities. "The term enemy capabilities is used rather than the term enemy courses of action to represent the major options open to an enemy to apply his force."[30] Fourth, he identifies and tests his own courses of action. Fifth, he analyses opposing courses of action. During this step, "the commander conducts a

dynamic analysis to determine the probable effect of each enemy capability on the success of each course of action." He tests courses of action for feasibility and acceptability. Sixth, he compares courses of action and seventh, he formulates a decision.

Air Force Decision Making

Air Force planning doctrine, as described by LTG Buster Glosson in the *Joint Air Force Component Commander (JFACC) Primer*, February 1994, is similar to Army and Navy doctrine.[31] The difference is in the scope of operations. From a service perspective, all air operations necessarily must consider operational level objectives.

> **For surface forces to fight effectively ...they must divide the overall effort geographically. Their...operations depend on geographical methods of control. In contrast, air forces possessing theater wide range forces divide their efforts by mission, campaign phase and result.[32]**

The key to Air Force planning is the JFACC's Estimate of the Situation, a systematic five step approach that ends in a decision. First, the JFACC states the objectives assigned by higher. Second, he assesses the situation and develops courses of action. Third, he analyzes the opposing courses of action. Fourth, he compares his own courses of action. Fifth, he decides on a recommended course of action to support

a Joint Force Commander's intent in a theater of operations.

The JFACC's estimate of the situation states what he intends to do. The Air Concept of Operations and Master Attack Plan are derivatives of the estimate and state how the air forces will accomplish the course of action. The Air Tasking Order (ATO) is the final product in the decision making process. It dictates which aircraft fly and when they will strike selected targets.

Marine Corps Decision Making

FMFM 3-1, Command and Staff Action, specifies the doctrinal planning sequence that Marine Corps officers follow when developing a solution to a military problem. There are fifteen steps (Appendix A).

Like each other service, the Marine Corps emphasizes an estimate process. Following mission analysis, the operations officer develops courses of action and distributes them to other staff officers. Each coordinating staff member then completes his respective estimate and forwards it to the commander with recommendations. The commander then selects "only those courses of action "which offer the greatest possibility for success...for detailed analysis and comparison."[33] He considers the staff input, analyzes the courses of action, rejects inferior solutions and

chooses the most favorable one.

Unlike the Army, the staff does not necessarily participate in the course of action analysis step of the process. Once the staff estimates are presented to the Marine Corps commander, he bears sole responsibility for choosing a course of action. "The precise mental processes he uses in arriving at his decision are his own concern."[34] Marine Corps doctrine only specifies that the decision the commander makes "reflect a thorough analysis of all information pertinent to the situation."[35]

Joint Decision Making

Joint Test Pub 5-0, Doctrine for Planning Joint Operations, governs the planning for the employment of joint forces throughout the operational continuum.[36] According to this manual, there are two decision making procedures. In peacetime, combatant commanders conduct *Deliberate Planning*. In times of war or crisis, joint operational level commanders use *Crisis Action Planning* (CAP) procedures.

The significant differences between the two procedures are the emphasis on fluidity as a function of time constraints and who has decision making authority.[37] First, long term, sequential and detailed planning based on assumptions typifies the deliberate process. Conversely, during a crisis, the planning

process is compressed. Simultaneous actions occur as planners respond to rapid changes in the situation.[38]

Second, in deliberate planning, the joint force commander selects the course of action for development into a contingency plan. The plan is approved by the Chairman, Joint Chiefs of Staff (CJCS). During a crisis, the National Command Authority recieves recommendations from the CJCS and selects the course of action.[39]

During peacetime or crisis, joint planners use the Joint Operation Planning and Execution System (JOPES). JOPES is the integrated joint conventional command and control system used to support joint military planning. It is focused at the operational level of war and incorporates policies, procedures and a single automated data support apparatus into a framework for developing plans.[40]

The JOPES framework is built around five primary functions -- threat identification and assessment, strategy determination, course of action development, detailed planning and implementation, and two supporting functions -- monitoring and simulation and analysis. The supporting functions facilitate the development and implementation of the plan by providing current, accurate data and measuring it against the other functions. The intended results are "fully integrated schedules of mobilization, employment and

sustainment activities based on the approved concept of operations or course of action."[41]

Joint doctrine provides planners with an organized approach to problem solving. Like each individual service methodology, the JOPES system specifies that planners assess the operational situation, develop courses of action, evaluate the solutions, compare them, and then recommend the best one for approval and implementation.

However, JOPES utility is limited; it does not necessarily ensure the effective integration of joint forces throughout all phases of the operation or campaign. First, a coordinated analysis technique, like the Army's "wargaming" process is absent. Service staffs and subordinate commands analyze courses of action from their own particular perspective and submit recommendations to the CINC. They do not get together and rehearse the actions and reactions of friendly, enemy, and neutral forces. Consequently, key players possess a more narrow appreciation of the interaction of operational systems, service component and supporting agency capabilities.[42]

Second, a common framework for analyzing complete courses of action is absent. *AFSC Pub 1, Joint Staff Officer's Guide, 1993,* highlights this key deficiency in JOPES.

> [In] the joint planning process...the

> **CINC [does] not have the analytical tools to assist in analyzing force employment, the critical phase from which all other requirements and planning activities stem."[43]**

Instead, planners use the automated data processing (ADP) support in JOPES to develop a Time Phased Force Deployment List (TPFDL) in support of a concept of operations."[44] Thus, JOPES is primarily a force requirement analysis tool, not a course of action analysis tool.

Summary

Service doctrines embrace a rational approach to decision making. Key to this approach is some form of an estimate process aimed at providing commanders with relevant information and recommendations needed to make sound decisions. The evaluation and comparison of alternative solutions is a critical step in every service's estimate procedures and each component describes how to do this.

Joint planning doctrine also adopts the estimate process and values course of action analysis as a vital step. However, current techniques for conducting and coordinating analysis at the operational level are absent.

In order to make recommendations for a useful joint course of action analysis method, the subsequent

sections review and analyze the different ways services currently measure the effectiveness of courses of action. The conclusions derived from the evaluation of each method against select criteria, support the recommendation for a common tool to evaluate solutions to joint military problems.

IV. COA Analysis Methods

As mentioned, joint operational planning doctrine does not provide a common methodology for course of action analysis. Yet, each service provides guidance on how to judge alternative solutions. Consequently, many planners rely on their services tactical procedures to analyze joint operational courses of action.[45] Planners justify using tactical methods for two reasons. First, officers are most familiar with the tactical level of war. Second, actions of small tactical units can have operational and even strategic impact.[46] Do these tactical analytical tools provide an optimal solution at the joint operational level?

This section briefly reviews each service's method for evaluating courses of action. Following the review, the next section evaluates the methods against three criteria to determine their adequacy at the joint operational level. For this study, a joint methodology is adequate if it: 1) addresses key operational level concepts and planning considerations,[47] 2) facilitates functional staff and service component interaction,[48] 3) is adaptable to a wide variety of situations.

Army Wargaming

The concept of wargaming is not unique to the US Army. Although the Army adopted wargames for training

in 1907, the Navy was first to use wargaming methods as analytic planning tools.[49] It was not until 1968 that the term "wargaming" was published in Army planning doctrine.[50] In 1984, *FM 101-5, Staff Organization and Operations*, the Army's principal staff manual, described two clear purposes for wargaming. Wargaming identifies those enemy capabilities that will assist in choosing the best course of action and commanders wargame to evaluate each friendly course of action against the enemy's capabilities.[51] Another objective of wargaming is a thoroughly synchronized course of action that generates maximum combat power at the critical time and place.[52] Unfortunately, the manual does not illustrate how to wargame.

Emerging Army doctrine stresses wargaming. The final draft of the new *FM 101-5, Command and Control for Commanders and Staff*, describes in detail how to evaluate courses of action. Similarly, the initial draft version of *FM 34-130, Intelligence Preparation of the Battlefield*, dedicates twenty-three pages to wargaming.[53] Clearly, wargaming is the Army's method of choice for course of action analysis. A brief description is in order.

Wargaming is a process aimed at stimulating ideas and insights about a particular course of action that might not otherwise have been discovered. During the process, commanders and staff visualize the flow of the

operation in a logical sequence. They attempt to foresee the action, reaction and counteraction of both friendly and enemy forces throughout all phases of an operation. As a result, planners identify critical tasks, control measures required, shortfalls, risks, options, and contingencies relative to a course of action.[54]

There are general rules regarding wargaming: 1) remain unbiased, 2) analyze each COA independently, 3) ensure each COA follows doctrinal tenets, 4) record key advantages and disadvantages as they are discovered, and 5) make sound judgements based on facts and assumptions, not on emotion.[55]

During the process, the planners follow eight steps (Appendix B). Step five, *List Significant Factors*, is critical. During this step, the staff and commander identify the criteria used to analyze each course of action and label them significant factors. These criteria are derived from the commander's guidance, higher's intent, constraints and restrictions. The staff also derives factors from doctrinal fundamentals and principles.[56] More significant factors do not necessarily lead to a better analysis; they may even cause a loss of focus; therefore, the commander must prioritize those factors he deems most critical for analysis.[57]

Once the commander and staff identify the

significant factors, they select among three wargaming techniques: 1) the avenue-in-depth approach, 2) the belt technique, and 3) the box method. Planners can use these methods separately or in combination, but "whichever technique is used, the entire staff must participate."[58]

The belt technique splits the area of operations into belts in order to examine simultaneously all forces affecting a particular event. As "the preferred method," it is especially useful for analyzing phased operations or when the enemy is arrayed in clearly defined echelons.

The shape of the belt results from the commander's battlefield analysis and the type of operation concerned. For example, in the offense, belts might cover the passage of lines, the movement or assault, the actions on the objectives, and exploitation. Belts may also overlap for a more complete visualization of the battlefield.[59]

The avenue-in-depth technique is useful in offensive operations or when terrain prohibits mutual support. It is also useful in defensive courses of action where the enemy movements are canalized.

When the commander wishes to focus on a specific event, the box technique is used. The commander isolates the area concerned and analyzes the event in detail. This technique is good when time is critical

and the commander is confident or assumes that friendly units will handle the other events occurring on the battlefield.[60]

How the staff records the wargame results is also important. Planners prefer a matrix technique because results are easily translated into graphic decision making products. With a matrix, each player can quickly visualize his individual actions relative to others in terms of time, space, and purpose. The matrix results in enhanced situational awareness, which can contribute to better synchronization of the plan.

Navy Analysis Procedures

In the Navy, course of action analysis begins during mission analysis. During this step of the decision making process, the commander "establishes the criteria by which the suitability of courses of action will later be judged..."[61] These criteria are derived from externally imposed contraints, such as assumptions and rules of engagement (ROE), and the objective.[62]

Clearly defined objectives provide the foundation for course of action analysis. The Navy characterizes objectives as abstract or concrete. In the abstract sense, the objective of an operation is the aim, or purpose, of the the action to be taken. For example, prevent disruption of supplies is an abstract objective. Concrete objectives are physical

objectives; they are definite, tactical features which must be controlled, defeated, or destroyed to achieve the aim. Key terrain or enemy air forces are physical objectives. Generally, each abstract objective contains one or more physical objectives. Upon close examination, a physical objective may be a "center of gravity...defined as the hub and power on which everything depends and against which all energies should be directed."[63]

Identifying physical objectives or a center of gravity can contribute to a more thorough analysis of courses of action. Generally, the aim provides the overarching criterion to measure a course of action's effectiveness. For example, given the mission to neutralize enemy air forces on an island to prevent disruption of friendly shipping for ten days, it is useful to consider the enemy air forces as one physical object and the airfield as another. The defeat of either physical object potentially satisfies the aim, at least until the enemy replaces the aircraft or repairs the airfield.[64] However, if the staff and commander could identify an enemy center of gravity, then its defeat beomes the central criterion for analysis.

The commander and staff evaluate other factors affecting possible courses of action to derive criteria for course of action development and analysis. There

are two broad categories: 1) characteristics of the area of operations and 2) relative combat power of opposing forces. The planners examine these factors to check the adequacy of friendly forces to accomplish the mission, identify the enemy's capabilities and estimate possible enemy courses of action. These factors then become the basis for establishing quantitative "measures of effectiveness."

Measures of effectiveness facilitate the testing and comparison of course of actions by focusing on vital objectives. These measures must:

> 1) Clearly reflect the criteria for success established during the mission analysis.
>
> 2) Provide a reasonable basis for comparing the relative merits of the courses of action under consideration.
>
> 3) Focus on the physical objectives [center of gravity] identified earlier and on the aspects of the interaction that lend themselves to that predicition."

Once the planners establish the measures of effectiveness, they conduct a dynamic analysis or "mental wargame" to determine the outcomes of each course of action based on the probable effect of each enemy capability versus friendly actions." Unlike the Army, the Navy does not specify techniques for wargaming. Yet comparably, the Navy suggests the use

of a matrix as a tool to help visualize the battle and record the outcomes of the interaction. Also, the wargame must consider and measure each key task.[67]

The next step is to interpret the results of the analysis. During this step, the commander evaluates each course of action's advantages and disadvantages "in terms of whatever governing factors he wishes to apply."[68] These may include selected principles of war or the measures of effectiveness established earlier. After this analysis, the planners compare the courses of action and weigh their relative merits. Finally, the commander selects one for final plan development.

Air Campaign Concept Development Process

Ostensibly, emerging air force doctrine recognizes that air operations must be synchronized with ground and naval operations.[69] The intended results of the Air Campaign Development Concept are an air concept of operations and master attack plan that support the attainment of a joint force commanders theater objectives. But according to CHECKMATE, the Air Force's chief operational planning division, "the Air Force "does not regularly speculate on other component concepts during employment (in country) or contingency studies[; it] focuses on the application of air forces."[70]

The development of an air concept of operations,

begins with an in-depth study of the political, economic, military and social forces affecting the theater concerned. From this study, the JFACC derives strategic centers of gravity and high pay off targets. Next, the JFACC follows the aerospace estimate of the situation framework to formulate and analyze air courses of action. The selected course of action becomes the JFACC's air concept of operations which specifies what air goals are to be accomplished and why they are important.[71]

The JFACC staff translates air goals stated in the air concept into objectives and tasks consistent with the four air force roles.[72] They specify how, when, where and under what conditions forces will be employed.[73] Once approved by the JFACC, air planners further refine the air concept of operation into an air campaign plan (ACP). The ACP phases and sequences air missions to accomplish specified objectives and their desired results.[74]

Several competing factors influence the determination of criteria for developing and measuring the effectiveness of an air course of action. On one hand, CHECKMATE states that the intent of the joint force commander is the most important criterion.[75] On the other hand, "logic and mission requirements seem to be the overriding reasons for selecting courses of action."[76]

During course of action development, the Air Force generally priortizes air missions aimed at achieving some degree of aerospace control.[77] These missions may not necessarily appear consistent with the CINC's desires.[78] The span of aerospace control, defined as theater, area, or localized, helps determine the scope of related air missions. Similarly, three standards: deny, disrupt and destroy, with their associated "measures of merit," bound the degree of success desired for aerospace control.[79] These considerations affect both development and analysis of air courses of action. Other considerations influencing course of action development include the availability of forces, the command and control structure required and the valuation and prioritization of targets.

In the next step of the air estimate, the air commander analyzes possible enemy courses of action to deduce the enemy's intentions. Four factors are key: 1) the perceived skill of the enemy commander, 2) enemy air/space options, 3) the ground and naval situation, and 4) enemy NBC options. Once the air commander derives the enemy's intentions, he wargames friendly and enemy alternatives to determine the practibility and the advantages and disadvantages of each air course of action.[80]

Air Force doctrine does not specify techniques for how to conduct a wargame.[81] The conclusion drawn is that

the JFACC bears responsibility for determining how to analyze air courses of action and how to synchronize the air plan with other component plans. Nevertheless, General Glosson states two governing factors for assessing success. First, does the course of action accomplish the strategic objective(s)? Second, does the solution favor future actions of friendly forces?[82]

A word of caution is in order here. From the language that describes these two criteria, Glosson could be suggesting that the JFACC determines what are the strategic objectives and how to attack them. In practice, the JFC decides, with JFACC input, what constitutes a strategic objective and how to employ available means to defeat them. The JFACC simply represents the air means.

V. Evaluation

This section evaluates the services' course of action analysis methods in light of three criteria. For this study, an analysis method is suitable for analyzing joint operations if it: 1) addresses key operational concepts, 2) facilitates service staff interaction and 3) is adaptable to a wide variety of situations.

Addresses Key Operational Concepts

The operational concepts addressed in *Joint Pub 3, Doctrine for Joint Operations*, should serve as the basis for analyzing joint courses of action.[83] As analytical tools, the use of key concepts can facilitate a unifying effort by helping commanders express their operational vision.[84] Commanders can apply concepts, such as center of gravity and decisive points, to determine physical objectives, to sequence battles and to more efficiently focus available combat power against a single aspect of the foe.[85] Therefore, an overarching analytical framework that focuses on these concepts would be useful to joint operational level planners.

Unfortunately, joint doctrine assumes that the services share a common interpretation of these concepts. Experience shows "there is yet no common

understanding among the services on what the concept[s] mean and how they should be employed." Also, current draft doctrinal publications express different views on these concepts. For example, the Navy states that "there can be only one center of gravity;" while the Air Force argues that multiple centers of gravity can exist.[96] For this reason, LTC Saxman, in his study, "The Concept of Center of Gravity: Does It Have Utility in Joint Doctrine and Campaign Planning?" concludes that commanders should address key operational concepts in their intent statement. The intent statement format facilitates explaining why and how the concepts relate to the operational objectives.[97] Ultimately, the services must agree to use one definition for the key concepts to be of real value in joint operations.

Army Wargaming

FM 100-5, Operations, defines four operational concepts: center of gravity, decisive points, lines of operation and culmination. However, *FM 101-5, Command Control for Commanders and Staff* , addresses only the concept of center of gravity -- "staffs should attempt to identify a center of gravity during mission analysis."[98] This new manual does not discuss the concept of center of gravity, or any other key concepts, in its sections on wargaming.

On the other hand, the manual does state that

during the wargaming process, planners should derive their criteria for analyzing courses of action from the higher's intent and commander's guidance. Thus, Army wargaming methods could easily accommodate the inclusion of key operational concepts as criteria for analysis, should doctrine be rewritten to state that commanders include these concepts, when appropriate, in their intent statements.

Navy Analysis Procedures

In Section IV, this study showed that once identified, the defeat of an enemy center of gravity should be the critical criterion for evaluating the merits of a naval course of action. Otherwise, the commander's intent remains the central criterion for analysis. Furthermore, although naval planning doctrine does not specifically address other operational concepts, the new *Naval Doctrine Publication 1* does.[89] Navy doctrine writers could easily update their planning doctrine to incorporate other key concepts as analytical criteria.

Air Campaign Development Process

The air campaign development concept is focused on the defeat of enemy centers of gravity. Once identified, enemy centers of gravity are translated into strategic objectives. General Glosson clearly

states that a key criterion for determining the effectiveness of an air course of action is the attainment of strategic objectives. Should the joint force commander use other operational concepts to clarify his intent, the Air Force could easily translate them into measurable merits of effectiveness to evaluate the feasibility and suitability of a course of action.

Facilitates Service Staff Interaction

> **To gain a full appreciation of the interaction of operational systems, service components, supporting agencies and commands, and allied forces, key planners from each of these elements must be involved in a dry run of each course of action....the current joint emphasis on separate [staff estimates and] analysis does not adequately address the intricacies of the operational level of war[20]**

Army Wargaming

Staff involvement is an integral piece of the Army's wargaming process. "Whichever technique is used, the staff must participate." This complete functional area representation provides a more thorough view of the course of action. Staff members and subordinate commanders discuss the actions and reactions between opposing forces to determine the

advantages and disadvantages for alternative solutions and record them on a synchronization matrix. Once the matrix is completed, they gain a full appreciation of how their particular functional areas relate to other functional areas and how they can better support the achievement of the commander's aims and intent. The result is a well thought out and more synchronized product.

Navy Analysis Procedures

In the Navy, "interactions between commander and staff are continuous[;] the staff estimates can be very influential in shaping the commander's priorities."[91] Although Navy doctrine does not specify continuous interaction among functional staff members, this study assumes that naval staff officers communicate during all stages of plan development.

Like the Army, the Navy values standard matrix formats for wargaming -- "they facilitate understanding by their readers."[92] The Navy constructs a matrix to visualize the interactions between enemy and friendly courses of action.[93] However, this appears to be the extent of its use. The Navy does not specify the utility of a matrix to visualize the interactions among functional areas, interagencies and subordinate commands. This deficiency is easily fixed with minor modifications to the formats.

Air Campaign Concept Development Process

Air Force doctrine mandates that a thorough understanding of other service doctrine and intentions is required during planning. However, it does not suggest the use of a tool, such as a matrix, to visualize the flow of the battle and to encourage service staff interaction during wargaming. Without such a tool, the awareness of other service staff actions and needs is significantly reduced.

For example, during the Gulf War, the services agreed to use a JFACC to govern the entire air war. But the JFACC was run by the Air Force, and reflected its cultural biases. The views of the Air Force dominated JFACC did not necessarily fit in with those of other services -- specific, Army requested targets were frequently removed from the ATO. This is not to suggest that the Air force was villainous; rather, the Air Force visualized the war through its own lens (as each service did).[94]

Ironically, the success of all large surface forces is dependent upon some degree of air superiority. It is axiomatic that limited air resources must be coordinated with all consumers to ensure their most efficient and effective use.

Adaptable to a Wide Variety of Situations

Up to this point, the focus of this study has been

on course of action development and analysis during contingency operations or war. In the cases used to illustrate key points, clearly defined national military objectives existed and it was easier to develop and analyze alternative joint military solutions to satisfy them.

Joint operations are not limited to war; they also embrace crisis situations classified under Operations Other Than War (OOTW). The dynamic, yet protracted nature of these OOTW environments is often characterized by unclear political aims, imposed restraints on the application of combat force, and subordination of military actions to other agencies. Traditional military paradigms do not fit. Are current methods of analysis adaptable to support other than war scenarios?

Army Wargaming

Normally during wargaming, the operations officer directs the process. Schemes of maneuver are outlined and critical events specified. At each event, functional staff members address their responsibilities as well as requirements for units and shortfalls relative to supporting the base maneuver plan. When shortfalls exist, the commander may choose to accept risk or modify the plan. Nevertheless, the focus maintained is on synchronizing all efforts to support

the ground scheme of maneuver to achieve the commander's intent.

With some changes, the Army wargaming process is adaptable to joint operations in both war and the OOTW environment. The component, agency or functional area best suited for a given mission, could lead the process. Other players could then focus their respective actions on how to meet the commander's intent. The use of a synchronization matrix would still enhance situational awareness and reduce redundancy in the application of scarce resources.

Navy Analysis Procedures

The Navy's procedures are adaptable to a wide variety of situations with minor changes. First, in the OOTW environment, the defeat of an enemy center of gravity may not be the focus. On the contrary, the aim may be to ensure the survivability of a center of gravity. For example, the priority focus during Hurricane Andrew relief operations was to reviving the school system --the "center of gravity."[95] Second, the Navy's use of quantifiable measures of effectiveness are easily transferable to OOTW scenarios. For example, one measure may be the number of people receiving food aid. Finally, the Navy, like the Army, could modify its wargaming matrices to accommodate a variety of conditions. The key is getting all key

players to participate.

Air Campaign Concept Development Process

The Air Campaign Concept Development Process is capable of supporting a wide variety of situations, but it is less flexible than other service methods. Certainly, the Air Force can contribute to achieving objectives in an OOTW situation. Show of force, airlifts, precision strikes, and air patrols are but a few options available. However, Air Force planning doctrine focuses on attacking to defeat enemy centers of gravity or creating the aerospace conditions to enhance other service components' operations. The Air Force uses three criteria: deny, disrupt or destroy to measure success in achieving these goals. Each standard focuses on engaging an enemy. Unfortunately, course of action analytical criteria that only orients on attacking an enemy are not necessarily useful in an OOTW environment. In order to support a wide variety of situations, Air Force doctrine should provide additional success criteria and measures of merit that are suitable for use in OOTW.

VI. Conclusion

Evaluation of possible courses of action is a critical step in the military's rational and systematic decision making process. A sound analytical framework should result in an optimal solution. At the very least, standard evaluation procedures and techniques can save valuable planning time and can improve staff and subordinate awareness of the entire operation.

Each branch of service provides guidance on how to evaluate alternative solutions. On the other hand, the joint military planning system, JOPES, does not specify how to analyze operational level courses of action. Consequently, many planners rely on their service unique tactical decision making procedures to evaluate joint operational level courses of action.

This study examined the adequacy of each service's procedures for use in evaluating joint operational level courses of action. At the joint operational level, the analytical process should address key concepts, facilitate interservice cooperation and coordination, and be useable in both a war and an OOTW environment.

Various service planning procedures are more similar than dissimilar. With some minor adjustments, the various analytical methods could adequately evaluate a joint operational level course of action.

First, each service's method could easily support the use of key operational concepts as course of action evaluation criteria. Universally understood concepts can help operational level commanders focus and synchronize combat power and they can facilitate a common understanding of the operation. Currently, the Navy and Air Force use the concept, center of gravity, as an evalutation criterion. They could easily incorporate others.

Second, the Army's and Navy's processes facilitate interstaff cooperation and coordination. Army doctrine explicity states staff officers will participate in the course of action analysis process. Both services use matrices as tools to visualize the flow of battle and record the results of the interaction between enemy and friendly units. These matrices help all key players gain a full appreciation of the operation; they could easily be modified to support interservice cooperation (Appendix C). The key is getting everyone involved in the analysis process.

Third, each service could modify other evaluation criteria for use in OOTW. The important piece is recognizing that typical enemy engagement criteria or the defeat of an enemy center of gravity may not be suitable for certain OOTW situations.

Each of the tactical methods described provides a good starting point for developing a common joint

analytical framework. Without some modifications, the tactical level evaluation processes are inadequate to cover the breadth and scope of joint operations. Joint doctrine addresses key considerations and concepts, such as strategic aims, centers of gravity and political factors. These concepts are worthwhile tools to evaluate and synchronize joint operations.

Thus, when rewritten, joint planning doctrine should describe a common course of action analysis framework that: 1) addresses key operational concepts 2) mandates staff and interservice cooperation, and 3) is sufficiently flexible to cover the broad range of joint operations.

VII. Endnotes

1. Carlotta is a mystical game in which there are no stated rules. Whoever is in charge, makes up the rules and must teach the other players how to play.

2. Joint Chiefs of Staff, *Joint Pub 1, Joint Warfare of the US Armed Forces,* (Washington DC: Joint Staff, 1991), p. iii.

3. Dr. Robert Epstein, in a lecture on the "Historical Practice of Operational Art." Presented to students at the School of Advanced Military Studies, Ft. Leavenworth, KS, 31 March 1994.

4. With the ATACMS, the Army can launch tactical missiles at ranges greater than 100 km. This capability impacts on the issue of which service has primary responsibility for deep operations, or more specifically, interdiction. The debate centers around the interpretation of the Fire Support Coordination Line (FSCL), a joint fire control measure. For this study, the debate illustrates that the Army and Air Force must improve coordination of deep fires because of improvements in weapons technology.

5. On April 14, 1994, in an After Action Review of a training exercise for students at the School of Advanced Military Studies, General (Retired) Richard Cavasos, Senior Observer for the Army's Battlefield Command Training Program exclaimed, "course of action analysis is the most important step in the decision making process."

6. Martin Van Creveld, *Command In War,* (Cambridge: Harvard University Press, 1985), p. 3.

7. During my research review, I did not find any joint manual that described criteria or techniques for conducting course of action analysis at the operational level. Similarly, MAJ Patrick Stalling identified this shortfall and addressed it in "What to Do, What to Do, Determining a Course of Action at the Operational Level of War," Monograph, (Ft. Leavenworth, KS: USACGSC, School of Advanced Military Studies, 1992), p. 24.

8. Joint Chiefs of Staff, *Joint Test Pub 5-0, Doctrine for Planning Joint Operations,* (Washington, DC: Joint Staff, 1991), p. I-6. There are four common principles that guide planning in

joint operations: 1) Objective, 2) *Unity of effort,* 3) Flexibility, 4) Timeliness [emphasis added].

9. Barry D. Watts, *The Foundations of U.S. Air Doctrine,* (Maxwell Air Force Base, AL: Air University Press, 1984), p. 22, and Dr. Robert Epstein.

10. Scott A. Hastings, "Is there a Doctrine in the House?" *Naval Institute Proceedings,* Volume 120, (April 1994), p. 36.

11. In Section III of this study, it is shown that the Marine Corps does not specify techniques for conducting course of action analysis; hence, it is not included in Section IV, COA Analysis Methods.

12. Joint Chiefs of Staff, *Joint Pub 3-0, Doctrine for Joint Operations,* (Washington DC: Joint Staff, 1993), p. III-6. According to this manual, operational art embraces both campaigns and major operations. Campaigns are a series of "related joint major operations that arrange tactical, operational and strategic actions to accomplish strategic and operational objectives." Within campaigns are major joint operations that "consist of coordinated actions in a single phase of a campaign and usually decide the course of the campaign." This study's focus is on joint operations.

13. Excerpt found in Mark T. Kimmit, "Decision Making in Contingency Operations: Different Conflicts, Different Challenges," Monograph, (Ft. Leavenworth, KS: USACGSC, School of Advanced Military Studies, 1989), p. 15.

2. Mark Adkin, *Urgent Fury,* (Lexington, Massachusetts, DC Haeth and Company, 1989), p. 337.

15. Mark Perry, *Four Stars,* (Boston, MA: Houghton Mifflin Company, 1989), p. 320-321.

3. Gordon R. Sullivan, "Projecting Strategic Land Combat Power," *Joint Forces Quarterly,* (Summer 1993), p. 9-10.

17. Joint Chiefs of Staff, *Joint Pub 3-0, Doctrine for Joint Operations,* (Washington, DC: Joint Staff, 1993), p. II-6.

18. Frederick Strain, "The New Joint Warfare," *Joint Force Quarterly*, Autumn 1993, p. 17-24. It is not the intent of this study to advocate that the US military should develop doctrine based only on "parallel warfare." This "one blow" focus may establish a dangerous precedent. Experience has shown that warfare is often protracted or that single battles of annihilation/paralysis have not necessarily resulted in desired end states. The study simply reflects the growing popularity of the concept of "simultaneity" in professional US military circles.

19. Ibid., p. 23. Strain also describes the relationships between service capabilities in several feasible scenarios (p. 18).

20. RADM J.C. Wylie, USN (Ret), *Military Strategy: A General Theory of Power Control* (New Brunswick, NJ: Rutgers University Press, 1967), p. 49. Quoted in Scott A. Hastings, "Is There A Doctrine in the House?," *Naval Institute Proceedings*, Volume 120, (April 1994), p. 36.

21. W. Edward Shirron, MAJ, "*An Optimum Method of Wargaming a Tactical and Operational Course of Action as an Integral Part of a Corps Commander's and G3's Estimate of the Situation in a Time Compressed Environment*," MMAS Thesis, (Ft. Leavenworth, KS: USACGSC School of Advanced Military Studies, 1984), p. 11-12.

22. Arthur J. Athens, MAJ, "*Unravelling the Mystery of Battlefield Coup d'oeil*," Monograph, (Ft. Leavenworth, KS: USACGSC School of Advanced Military Studies, 1992), p. 1.

23. US Army, *FM 101-5, Command and Control for Commanders and Staff* (Final Draft), (Washington DC: Headquarters, Department of the Army, 1993), p. 4-1-4-2.

24. Ibid., p. 4-6.

25. William E. Depuy, GEN, "Concepts of Operation: The Heart of Command, the Tool of Doctrine," *ARMY*, (August 1988), p. 29.

26. LTC Johnson Beach and Major Brad C. Scott, "Expanding the Limits of Combat Decision Making," *Military Review*, (April 1989), p. 55.

27. Doctrine does specify that the commander and staff should jointly "wargame" solutions. In reality, some commanders choose to conduct their own wargaming in isolation from the staff. Nevertheless, the commander normally provides guidance on how to wargame and on which criteria to use for the evaluation of the courses of action. Often, battlefield situations prevent the the commander from becoming involved in a detailed wargame.

28. US Army, *FM 101-5, Command and Control for Commanders and Staff* (Final Draft), p. 4-6-4-7.

29. US Navy, *NWP 11, Naval Operational Planning*, (Rev. F), (Washington DC: Office of the Chief of Naval Operations, Department of the Navy, 1991), p. 1-2-1-3.

30. Ibid., p. 2-8-2-9.

31. US Air Force, *Joint Air Force Air Component Commander (JFACC) Primer*, (Washington DC: Headquarters, United States Air Force, February 1994). The foreword in the JFACC Primer states that the content of the document reflects the latest Air Force doctrine on joint operations. Accordingly, the pamphlet covers "how to best organize, plan, and execute joint air operations."

32. Ibid., p. 8.

33. US Navy, *FMFM 3-1, Command and Staff Action*, (Washington, DC: Headquarters, United States Marine Corps, 1979), p. 46-52.

34. Ibid., p. 50.

35. Ibid., p. 50.

36. Joint Chiefs of Staff, *Joint Test Pub 5-0, Doctrine for Planning Joint Operations*, (Washington DC: Joint Staff, 1991), p. iii.

37. Patrick A. Stallings, MAJ, "What to Do, What to Do? Determining a Course of Action at the Operational Level of War," Monograph, (Ft. Leavenworth, KS: USACGSC, School of Advanced Military Studies, 1992), p. 23.

38. Ibid., p. 23.

39. Ibid., p. 24.

40. Joint Chiefs of Staff, *Joint Pub 5-03.1, Joint Operation Planning and Execution System, Volume I (Planning Policies and Procedures)*, (Washington DC: Joint Staff, 1993), p. II-6.

41. *AFSC PUB 1, The Joint Staff Officer's Guide*, (Washington DC: US Government Printing Office, 1993), p. 5-28-5-33.

42. Stallings, p. 34.

43. *AFSC PUB 1, The Joint Staff Officer's Guide*, p. 5-39. According to this publication, the Modern Aids to Planning Program (MAPP) developed the capability in 1989 to support staffs in analysis. "MAPP permits CINC's to analyze alternative courses of action and force mixes rapidily to determine the sensitivity of assumptions in executing a COA [course of action]." Interestingly, this tool is not addressed in doctrinal joint publications. Therefore, this study accepts JOPES as the principle planning tool for joint operations.

44. Ibid., p. 5-45. Special training is required to use JOPES automated data procedures. The software is extremely difficult to operate and is inefficient, according to an interview with MAJ Richard Dixon, a certified JOPES user. MAJ Timothy Coffin, a former intern on the Joint Staff, also shares this opinion of the JOPES ADP system.

45. During campaign planning exercises, several students at the School of Advanced Military Studies, Ft. Leavenworth, KS, used tactical level procedures to evaluate joint operational level solutions.

46. US Army, *FM 100-5, Operations*, (Washington DC: Headquarters, Department of the Army, 1993), p. 13-1. This is especially true in an Operation Other than War (OOTW) environment.

47. Stallings, p. 27. In his study, Stallings concluded that an "operational decision making model must tie operational level concepts into course of action development and analysis processes."

48. During research, several studies and articles indicated that staff interaction is critical to a more thorough synchronization of effort on the battlefield. Applying the same logic, this study argues that interaction between service components during

all phases of the planning process would improve operational level synchronization.

49. John Prados, *Pentagon Games[:] Wargames and the American Military*, (New York, NY: Harper & Row Publishers, 1987), p. 4.

50. Milano, p. 7.

51. US Army, *FM 101-5, Staff Organization and Operations*, (Washington DC: Headquarters, Department of the Army, 1984), p. E-5-E-6.

52. Milano, p. 1.

53. US Army, *FM 34-130, Intelligence Preparation of the Battlefield* (Initial Draft), (Washington DC: Headquarters, Department of the Army, 1993), p. A-1-A-23.

54. US Army, *FM 101-5, Command and Control for Commanders and Staff* (Final Draft), 1993, p. F-1-F-4.

55. Ibid., p. F-4.

56. Ibid., p. F-7-F-8.

57. It is imperative that the commander consider the time available when assigning the amount of factors to be analyzed.

58. Ibid., p. F-14.

59. Ibid., p. F-9-F-10.

60. Ibid., p. F-10-F-11.

61. US Navy, *NWP 11, Naval Operational Planning*, p. 2-7.

62. Ibid., p. 2-5-2-7.

63. Ibid., p. 2-6. The Navy's use of the Clausewitizian concept of center gravity is also that which is used by *Joint Pub 3-0, Doctrine for Joint Operations*, 1993, p. III-27.

64. Ibid., p. 2-6-2-7.

65. Ibid., p. 2-13.

66. Ibid., p. 2-13.

67. Ibid., p. 2-14.

68. Ibid., p. 2-14. The commander can use the principles of war as governing factors. Similarly, the commander could easily substitute the principles of joint operations, outlined in Joint Pub 3-0, as governing factors.

69. Air Force use of the term campaign is potentially misleading. Normally, commanders view a campaign as series of distinct battles, distributed over time and space. The Air Force uses this term to show that its different missions reflect distinct battles. The first mission normally focuses on establishing some degree of aerospace control -- the first air force battle. Other missions, such as interdiction, often occur simultaneously with establishing aerospace control. They are not necessarily distributed over time and space; but they do reflect a different purpose for using aircraft. Thus, they are distinct air battles so to speak.

70. USAF/XOOC, "The CHECKMATE Air Campaign Development Process," (Washington DC: Headquarters, United States Air Force, 1993), p. 18. This point is underscored in Thomas a Keaney and Eliot A Cohen, *Gulf War Air Power Survey Summary Report* (Draft Copy), (Washington DC: Headquarters, United States Air Force, 1993), Chapter 2, p. 11-14. The report states that during the development of the four phase plan to eject Iraqis from Kuwait, the air campaign concept development for Phase I "proceeded in a separate highly classified process...A Special Planning Group directed by General Glosson, operated in secrecy; most of the CENTAF staff new little beyond the fact of the group's existence." The group was labeled as the "Black Hole" and included Army, Navy, and Marine Corps representatives, but Air Force officers predominated.

On the surface, the "Black Hole's" need for secrecy was vindicated. However, the efficacy of having a secret air power planning cell must be placed in context. During the Gulf War, the US led coalition enjoyed a vast numerical and quality superiority in aerospace power. "[T]he size of the coalition air force allowed considerable flexibility ...and permitted the first three phases of the campaign to begin almost simultaneously." In future joint operations, the availability of aircraft may be

significantly reduced and the threat to air operations increased. The commencement of ground operations may occur prior to the air force establishing theater aerospace control. With limited capabilities, it is imperative that all operations be more fully synchronized -- every component must understand every other component's part throughout all phases of the plan.

71. US Air Force, *JFACC Primer*, 1994, p. 36-45.

72. US Air Force, *Air Force Manual (AFM) 1-1, Basic Aerospace Doctrine of the United States Air Force, Volume II*, (Washington DC: Headquarters, Department of the Air Force,1992), p. 103-109. The manual defines the Air Force's four roles: 1) Aerospace Control, 2) Force Application, 3) Force Enhancement, and 4) Force Support. Within in each role are respective missions and tasks. For example, under the role of aerospace control, the air force mission is to conduct counter-air operations in order to create conditions conducive to future air [and ground] operations. Tasks within the counter-air mission include suppression of enemy air defense (SEAD), defensive counter-air and offensive counter-air.

73. Ibid., p. 20. In this case, objective is defined as what is to be accomplished -- the aim. This study recommends that joint doctrine, when rewritten, clearly delineate between objective and aim.

74. USAF/XOOC, "The CHECKMATE Air Campaign Concept Development Process," p. 17.

75. US Air Force, *JFACC Primer*, 1994, p. 39.

76. USAF/XOOC, "The CHECKMATE Air Campaign Concept Development Process," p. 16.

77. Ibid., p. 10-17.

78. Rick Atkinson, *Crusade*, (Boston, MA: Houghton Mifflin Company, 1993), p. 105-106. This is an important point that bears directly on the goal of this study. Just two days prior to offensive operations, Air Force Generals Horner and Glosson and LTC Deptula explained to General Schwarzkopf that during the initial hours of the air campaign, B-52 bombers would not strike Republican Guard forces. This jolted Schwarzkopf who was

preoccupied with the Republican Guard and viewed it as the operational "center of gravity." Furthermore, Schwarzkopf stressed in his intent that Iraqi ground forces would be reduced by at least 50%. He clearly expected air attacks against these forces "from hour one."

Generals Horner and Glosson understood Schwarzkopf's intent, but "never planned to bomb [the Republican Guard]" until the threat from surface to air missiles was minimized. The Air Force estimated that the reduction of this threat would take a week.

Of particular relevance to this study, is Glosson's thought: "We put the entire air campaign together *by ourselves*...with no help from you [emphasis added]." This suggests the need for interservice coordination during course of action development and analysis; hence, this study uses it as a criteria for evaluating course of action analysis methods.

79. USAF/XOOC, "The CHECKMATE Air Campaign Concept Development Process," p. 23. Measures of merit are stated in plain language and add a measurable aspect to the defined standard, such as a percentage of target set attacked or destroyed.

80. US Air Force, *JFACC Primer,* 1994, p. 42. There is a subtle difference between the Air Force's estimate and the Army's estimate, which may cause some confusion. During "comparison of courses of action," the Air Force evaluates friendly courses of action against enemy courses of action to determine its advantages and disadvantages -- "wargame." (This study did not find the term "wargame" used in official Air Force publications, but the Air Forces's description of the process was consistent with the term used by the Army and Navy.) In the Army, the comparison step measures the relative merits between each previously analyzed course of action against specified criteria.

81. USAF/XOOC, "The Air Campaign Planning Tool," (Draft Pamphlet), (Washington DC: Headquarters, United States Air Force, 1993. The Advanced Research Projects Agency (ARPA)is developing a prototype computer aided application, The Air Campaign Planning Tool (ACPT) to assist JFACCs in formulating a vision for an air concept and translating that vision into specific target lists. "The primary output for the ACPT will be a prioritized target list, a course of action with an associated force structure requirement, and a deployment schedule. These products shape the Master Attack Plan and ATO. The ACPT is not intended to "replace

normal human cognitve processes; but rather presents information recommendations in a way the speeds the decision making process."

82. US Air Force, *JFACC Primer*, 1994, p. 42.

83. Charles R. Viale, " *A Conversation at the Club[:] Another Analysis of the Concept of Center of Gravity,"* Monograph, (Fort Leavenworth, KS: USACGSC, School of Advanced Military Studies, 1988), p. 11.

84. Under the sub-heading of "Operational Art," Chapter III, *Joint Pub 3-0, Doctrine for Joint Operations* discusses in detail the concepts of center of gravity, decisive points, culmination, simlutaneity, depth, balance, anticipation, and commander's intent. All are key planning considerations for the operational level joint commander.

85. Joint Chiefs of Staff, *Joint Pub 3-0, Doctrine for Joint Operations*, 1993, p. III-13-III-31.

86. John B. Saxman, LTC., *"The Concept of Center of Gravity: Does It Have Utility in Joint Doctrine and Campaign Planning?"* Monograph, (Fort Leavenworth, KS: USACGSC, School of Advanced Military Studies, 1988), p. 38.

87. Ibid., p. 42.

88. US Army, *FM 100-5, Operations*, 1993, p. 6-7-6-8; and *FM 101-5, Command and Control for Commanders and Staff*, (Final Draft), 1993, p. 4-13.

89. US Navy, *Naval Doctrine Publication 1*, 1994, p. 35-43. The manual discusses center of gravity,critical vulnerablity (decisive point), tempo, focus of effort and main effort.

90. Stallings, p. 34-38.

91. US Navy, *NWP 11, Naval Operational Planning*, p. 2-1.

92. Ibid., p. 1-3.

93. Ibid., p. 2-14.

94. Bernard E. Trainor, "Jointness, Service Culture, and the Gulf War," Joint Force Quarterly, Winter 1993-1994, p. 72.

95. During a discussion of OOTW at the School of Advanced Military Studies, BG House, Deputy Commandant of CGSC, stated that the placing the schools back into operation was the "center of gravity." In August 1992, BG House participated in disaster assistance operations to victims of Hurricane Andrew.

VIII. Bibliography

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Appendix A: Illustrated Decision Making Methods

Army Estimate of the Situation

1. DETAILED MISSION ANALYSIS

2. SITUATION AND COURSES OF ACTION

   A. ANALYSIS OF SITUATION
   B. DEVELOPMENT OF COURSES OF ACTION

3. ANALYSIS OF COURSES OF ACTION

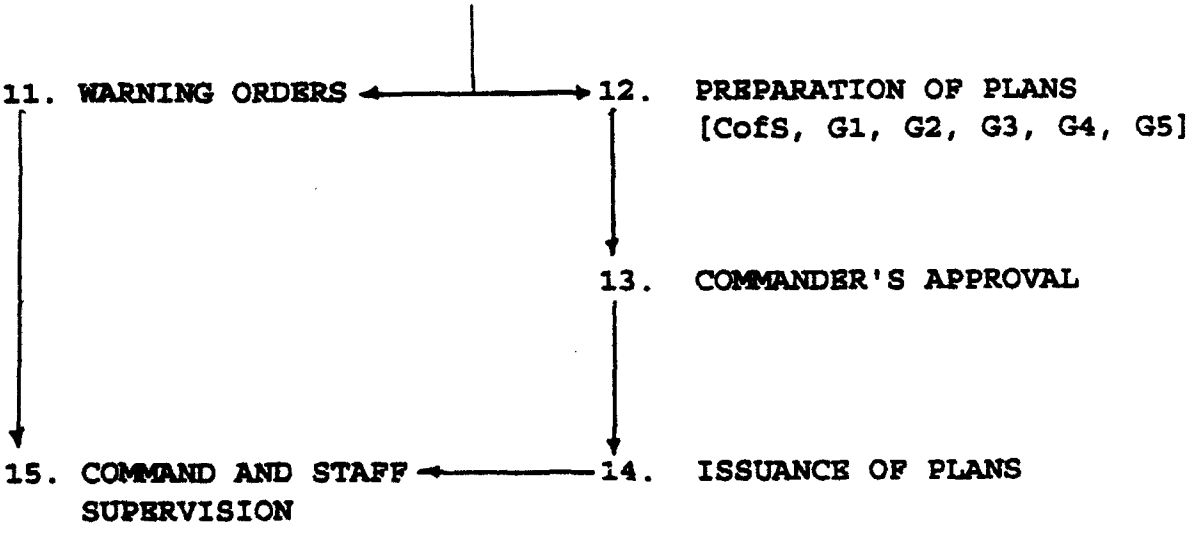
4. COMPARISON OF COURSES OF ACTION

5. RECOMMENDATION OR DECISION

Appendix A: Illustrated Decision Making Methods

Marine Corps Sequence of Command and Staff Action

1. RECEIPT OF MISSION
2. MISSION ANALYSIS
3. INFORMATION REQUIREMENTS
4. INITIAL STAFF ORIENTATION
5. COMMANDER'S PLANNING GUIDANCE
6. COURSES OF ACTION
7. STAFF ESTIMATES
8. COMMANDER'S ESTIMATE OF THE SITUATION
9. COMMANDER'S DECISION
10. COMMANDER'S CONCEPT OF OPERATIONS



Appendix B: Wargaming Process

Wargaming Process

1. GATHER THE TOOLS

2. LIST ALL FRIENDLY FORCES

3. LIST ASSUMPTIONS

4. LIST KNOWN CRITICAL EVENTS AND DECISION POINTS

5. LIST SIGNIFICANT FACTORS

6. SELECT THE WARGAME METHOD

7. SELECT A TECHNIQUE TO RECORD AND DISPLAY RESULTS

8. WARGAME THE BATTLE AND ASSESS THE RESULTS

Appendix C: Sample Matrix

MISSION:					
CONCEPT OF OPERATION: **MAIN EFFORT:** **PURPOSE:** **TASK** **SUPPORTING EFFFORT(S):** **PURPOSE:** **TASK:**					
INTENT:					
CENTER OF GRAVITY:					
DECISIVE POINT(S):					
MEASURE(S) OF EFFECTIVENESS:					
CRITICAL EVENT / PHASE:					
FUNCTION	**LAND FORCES**	**AIR FORCES**	**NAVAL FORCES**	**SPECIAL FORCES**	**AGENCY/ NGO**
INTELLIGENCE					
DECEPTION					
FIRES					
FIRES, NUCLEAR					
MANEUVER					
AIR OPERATIONS					
AVIATION OPERATOINS					
SEAD					
ADA					

COMMUNICATION					
EW					
PYSOPS					
CIVIL AFFAIRS					
ENGINEER					
CSS **MEDICAL:** **MANNING:** **FUELING:** **ARMING:** **MAINTENANCE:**					
TRANSPORTATION					
SECURITY					
ROE					

This matrix is designed to as an aid to evaluate and synchronize a joint operation. The functions listed are only a representative sample. Modification of the matrix to fit a particular situation is encouraged.